



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/514,408	06/08/2005	Douglas A. Doers	025234-9003-01	6863
23409 7590 06/26/2007 MICHAEL BEST & FRIEDRICH, LLP 100 E WISCONSIN AVENUE Suite 3300 MILWAUKEE, WI 53202			EXAMINER LOPEZ, FRANK D	
			ART UNIT 3745	PAPER NUMBER
			MAIL DATE 06/26/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/514,408

Applicant(s)

DOERS, DOUGLAS A.

Examiner

F. Daniel Lopez

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on June 20, 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-6, 8-12, 14-16, 18, 22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-6, 8-12 and 14-16 is/are allowed.
- 6) ☐ Claim(s) 18, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Amendment

Applicant's arguments filed June 20, 2007, have been fully considered and were persuasive concerning the rejection of claims 21-23 (the limitations of claim 19-21 being added to claim 18). Therefore, the finality of the previous Office action has been withdrawn.

Applicant's arguments with respect to claims 18, 22 and 23 have been considered but are deemed to be moot in view of the new grounds of rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

Claims 18, 22 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 18 line 19-21 "wherein threw wall portion...openings;" should be deleted, sicne it repeats the limitation of line 16-18.

Claims 22 and 23 are indefinite since they depend from claim 18.

Claim Rejections - 35 USC § 103

Claims 18, 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Gaiser et al in view of Ribeiro et al, Zhu et al, Jennings, Guenther, Burnand and Hazen et al. Gaiser et al discloses a piston comprising a crown (76) welded to a skirt (78); wherein the crown has a lower surface facing an upper surface of a top portion of the skirt, defining an annular lubrication cavity (42); the skirt having a cylindrically shaped wall portion extending from the top portion, defining a skirt cavity (72); wherein the top portion includes a lower surface defining bearing surfaces (58), extending inwardly from diametrically opposed circular openings, for a wristpin; wherein the top portion includes two inlet holes (80) communicating between the skirt and lubricating cavities, to supply lubricant from the skirt cavity to the lubrication cavity, and first and second lubrication holes (90), communicating with an annular cavity (42), on opposite

sides of a central cavity (54), and communicating with the bearing surfaces, to supply lubricant from the lubrication cavity to the bearing surface; wherein the central cavity is defined by the lower surface of the crown and side surfaces of the top portion of the skirt; wherein the central cavity communicates with lubrication cavity by two bypass holes (86); and wherein the central cavity is open at the bottom to allow the central cavity to communicate with the skirt cavity and for a connecting rod (52) to fit within the central cavity; with a plane including a central axis of the piston, and a longitudinal axis of the bearing surface; but does not disclose that the central cavity is defined by the upper surface of the top portion, with a central lubrication hole, located in the plane, allows the central cavity to communicate with the skirt cavity; that the central cavity includes internal threads which engages a threaded boss of the crown or the top portion, to join the crown to the skirt; that the bearing surfaces is a bearing surface extending across substantially the entire width of the skirt, such that it extends from one of the openings to the other opening; that the first and second lubrication holes are located in the plane; or that diameters of the first, second and central lubrication holes are 0.125 inches.

Ribeiro et al teaches, for a piston comprising a crown (12) welded to a skirt (14); wherein the crown has a lower surface facing an upper surface of a top portion of the skirt, defining an annular lubrication cavity (62); the skirt having a cylindrically shaped wall portion extending from the top portion, defining a skirt cavity (80); wherein the top portion includes a lower surfaces defining a bearing surface (100) for a wristpin; wherein a central cavity (68) is defined by the lower surface of the crown and side surfaces of the top portion of the skirt; wherein the central cavity communicates with lubrication cavity by two bypass holes (70); that the central cavity is defined by the upper surface (88) of the top portion, with a central lubrication hole (72), located in the plane, allows the central cavity to communicate with the skirt cavity; wherein a connecting rod can be fitted below the central cavity (see fig 3).

Zhu et al teaches, for a piston (fig 4) comprising a crown (202) welded to a skirt (204); wherein the crown has a lower surface facing an upper surface of a top portion of the skirt, defining an annular lubrication cavity (222); the skirt having a cylindrically shaped wall portion extending from the top portion, defining a skirt cavity (227); wherein the top portion includes a lower surfaces defining a bearing surface (221a) for a wristpin; wherein a central cavity (220) is defined by the lower surface of the crown and side surfaces of the top portion of the skirt; wherein the central cavity communicates with lubrication cavity by two bypass holes (223); that the central cavity is defined by the upper surface (206d) of the top portion, with a central lubrication hole (206e) allowing the central cavity to communicate with the skirt cavity, for the purpose of containing a certain volume of oil in the central cavity, to cool an upper wall of the central cavity (column 4 line 45-54).

Since Gaiser et al, Ribeiro et al and Zhu et al are all from the same field of endeavor, the purpose disclosed by Zhu et al would have been recognized in the pertinent art of Gaiser et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to define the central cavity of Gaiser et al by the upper surface of the top portion, with a central lubrication hole, located in the plane, allows the central cavity to communicate with the skirt cavity, as taught by Ribeiro et al, for the purpose of containing a certain volume of oil in the central cavity, to cool an upper wall of the central cavity, as taught by Zhu et al.

Jennings teaches, for a piston (1) comprising first and second lubrication holes (9) connected between an annular lubrication cavity (3) and bearing surfaces (7) for a wristpin; wherein a plane includes a central axis (e.g. line 2-2 of fig 1) of the piston and a longitudinal axis of the bearing surface; that the lubrication holes are in the plane.

Since the placement of the first and second lubrication holes of Gaiser et al and Jennings are interchangeable in the piston art, it would have been obvious at the time the invention was made to one having ordinary skill in the art to locate the first and second lubrication holes of Gaiser et al in the plane, as taught by Jennings, as a matter of engineering expediency.

Note that Gaiser et al teaches that the first and second lubrication holes preferably originate at a lowest part of the annular cavity (column 5 line 39-40), and the first and second lubrication holes of Jennings also originate at a lowest part of the annular cavity (e.g. fig 1 or 2).

Guenther teaches, for a piston comprising a crown (11) joined to a skirt (5); wherein the crown has a lower surface (21) facing an upper surface of a top portion of the skirt, defining an annular lubrication cavity; the skirt having a cylindrically shaped wall portion extending from the top portion, defining a skirt cavity (below 32); wherein the piston includes a bearing surface (27)), extending inwardly from diametrically opposed circular openings, for a wristpin (13); wherein a central cavity (where 46 and 48 meet) is defined in the piston; wherein the central cavity communicates with lubrication cavity by bypass holes (48); that the bearing surface is a single bearing surface extending across substantially the entire width of the skirt, from one of the openings to the other opening and wherein the central cavity communicates with the bearing surface to lubricate the wristpin.

Burnand teaches, for a piston comprising a crown (52) joined to a skirt (54); wherein the piston includes a bearing surface (27) for a wristpin (13); that the bearing surface is a single bearing surface extending across substantially the entire width of the skirt, for the purpose of spreading the load of the piston along the entire wristpin, thereby avoiding a bending moment on the pin (column 1 line 35-40).

Since Gaiser et al, Guenther and Burnand are all from the same field of endeavor, the purpose disclosed by Burnand would have been recognized in the pertinent art of Gaiser et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to make the bearing surfaces of Gaiser et al a single bearing surface extending across substantially the entire width of the skirt, from one of the openings to the other opening; wherein the central cavity communicates with the bearing surface to lubricate the wristpin, as taught by Guenther, for the purpose of spreading the load of the piston along the entire wristpin, thereby avoiding a bending moment on the pin, as taught by Burnand.

Art Unit: 3745

Hazen et al teaches, for a piston comprising a crown (1) joined to a skirt (2); wherein the crown has a lower surface facing an upper surface of a top portion of the skirt, defining an annular lubrication cavity (11); the skirt having a cylindrically shaped wall portion extending from the top portion, defining a skirt cavity (within 18); wherein the top portion includes a lower surfaces defining a bearing surface (4) for a wristpin; wherein a central cavity (20) is defined by the lower surface of the crown and upper surface of the top portion of the skirt; wherein the central cavity communicates with lubrication cavity by bypass holes (22); that the central cavity includes internal threads (7) which engages a threaded boss (8) of the crown, for the purpose of joining the crown to the skirt.

Since the weld joint between the crown and skirt of the modified Gaiser et al and the threaded joint between the crown and skirt of Hazen et al are interchangeable in the piston art, it would have been obvious at the time the invention was made to one having ordinary skill in the art to replace the weld joint of the modified Gaiser et al with a threaded joint, wherein the central cavity includes internal threads which engages a threaded boss of the crown, as taught by Hazen et al, as a matter of engineering expediency.

One having ordinary skill in the art would recognize that pistons come in a variety of sizes, and that the lubrication holes would be sized appropriately. Therefore, it would have been obvious at the time the invention was made to one having ordinary skill in the art to make a diameter of the first, second and central lubrication holes of the modified Gaiser et al 0.125 inches, as a matter of engineering expediency.

Conclusion

Claims 1-6, 8-12, 14-16 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571- 272-4821. The examiner can normally be reached on Monday-Thursday from 6:10 AM -3:40 PM.

Art Unit: 3745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is 571-273-8300. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.

/F. Daniel Lopez/

F. Daniel Lopez
Primary Examiner
Art Unit 3745
June 21, 2007